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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,278	07/24/2003	Garth Cruickshank	218728-000193	9601

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EXAMINER	
LIEW, ALEX KOK SOON	

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 12/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/626,278	CRUICKSHANK ET AL.	
	Examiner	Art Unit	
	Alex Liew	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 8-11* is/are rejected.

7)☒ Claim(s) *6 and 7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 6 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With regards to claim 6, the examiner's search does not show any applicable prior art or suggestion disclosing calculating the 2-dimensional distribution of radiation in the pixels using the formula shown in claim 6 line 4 in combination with claim 1.

With regards to claim 7, the examiner's search does not show any applicable prior art or suggestion disclosing calculating the error function using the formula shown in claim 7 line 4 in combination with claim 1.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Ito (US pub no 2003/0150996).

With regards to claim 1, Ito discloses an imaging process for generating a 3-dimensional, representation of a 3-dimensional observation field, said process including at least the following steps:

a) detecting radiations emitted by a plurality of voxels in the observation field, through a collimator having radiation transmitting areas which are non-uniformly distributed, said radiations being detected in a set of determining a detected 2-dimension distribution H(I,J) of the radiations detected through the collimator, I and J being two indicia representing a position of each pixel where the radiations are detected (see paragraph 66 lines 1 – 8 and fig 7 – S1 and S2),

b) and determining an estimated 3-dimension distribution of the radiation emissions of the vowels in the observation field, which I, j and k are three indicia representing the position of each vowel, said estimated distribution of the radiation emissions constituting said 3-dimension representation of the observation field, the estimated distribution of radiation emissions being estimated by an iterative process comprising successive iterations conducted successively for several groups of vowels of the observation field (see all of fig 7), starting from a provisional estimated distribution of the radiation emissions hes_0 and each nth iteration includes the following sub-steps

b1) determining a calculated 2-dimension distribution of radiations in the pixels, corresponding to the provisional distribution of radiation emissions (see paragraph 66 lines 9 – 14)

b2) calculating an error function representative of differences between said calculated distribution and said detected distribution (see paragraph 67 lines 1 – 4),

b3) if said error function has a value which is comprised in a predetermined range, stopping the iterative process and deciding that hes (i,j,k) = hes_{n-1} (i,j,k); and if said error function has a value which is not comprised in said predetermined range determining a new provisional estimated distribution of radiation emissions so as to decrease the error function (see paragraph 67 lines 5 – 11).

With regards to claim 2, Ito discloses an imaging method according to claim 1, wherein in (a), the collimator through which said radiation are detected have a unique spatial pulse response for each vowel of the observation field (see fig 7 – each vowels read as each projection data).

With regards to claim 10, Ito discloses an imaging method according to claim 1, wherein step, said detected 2-dimension distribution is representation of a number of radiations detected in each pixel in a certain bandwidth and in step (see fig 6 – the 'bandwidth' is within the rectangular sensor – the rectangular sensor detects radiation within the sensor), and said estimated 3-dimension distribution of the radiation emissions is

representative of a number of radiation emitted by the voxels of the observation field in said bandwidth (see fig 7 – S1).

With regards to claim 11, Ito discloses an imaging device specially designed to carry out the imaging method according to claim 1 (see fig 6).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 3 – 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito ('996) as applied to claim 1 further in view of Beynon (IEEE article titled: "Gabor zone plate with binary transmittance values").

With regards to claim 3, Ito discloses all of the claim elements / features as discussed above in rejection for claim 1 and incorporated herein by reference and a rectangular radiation sensor which detects radiation and it's location but fails to disclose having a circular radiation sensor with a radius of r. Beynon discloses an imaging method according to clam 1, wherein in step (a), the radiation are detected around a main axis and the collimator through which said radiations are detected has an average transmittance averaged on a circle of radius r around said main axis, which varies with

said radius r (see page 554, front page, first column – underlined sections – submitted in IDS and figure 1 – the main axis is on the z-axis). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include a circular radiation sensor because one can vary the radius of the collimator to control the number of radiation present to calibrate the system so one can obtain improved results.

With regards to claim 4 and 5, see the citations for claim 3.

With regards to claim 9, Ito discloses all of the claim elements / features as discussed above in rejection for claim 1 and incorporated herein by reference, but fails to disclose each group of vowels includes several non-contiguous vowels. Beynon discloses an imaging method according to clam 1, wherein each group of vowels includes several non-contiguous vowels (see fig 2). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include each group of vowels includes several non-contiguous vowels because to count to number of radiation within the collimator using the darken area as the radiation location and white areas as non-radiation location, the system is able to improve the number of radiation estimate by just counting the number of darken areas in the produced image.

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito ('996) as applied to claim 1 further in view of Engler (US pat no 7,142,634).

Ito discloses all of the claim elements / features as discussed above in rejection for claim 1 and incorporated herein by reference, but fails to disclose estimating distribution of radiation emissions by a gradient method. Engler discloses an imaging method according to claim 1, wherein in sub-step (b3), one determines the new provisional estimated distribution of radiation emissions by a gradient method (see col. 5 lines 13 – 19). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include estimating distribution of radiation emissions by a gradient method because when there is a radiation vowel present at a certain location, the pixel will show up as darken when there is no radiation at a location, the pixel will show up as white pixel, so the gradient will detect the change in pixel indicating there is radiation at indicated location, which improve radiation position detection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Liew whose telephone number is (571)272-8623. The examiner can normally be reached on 9:30AM - 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alex Liew
AU2624
11/30/06

JOSEPH MANCUSO
SUPERVISORY PATENT EXAMINER